

NASA TECH BRIEF



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Sprayed Shielding of Plastic-Encapsulated Electronic Modules

The problem:

To develop a metallic coating for shielding of plastic-encapsulated electronic modules against radio-frequency interference.

The solution:

A metallic coating directly sprayed on the modules provides simple and reliable lightweight protection. A plasma-arc spray and/or an oxyacetylene-flame spray may be used; the former is preferred for its lower content of oxides in the coating. Aluminum and copper are the most effective metals.

How it's done:

Sharp edges on the module are first blunted to a radius of 0.01 in. or greater. The module is then blasted with No. 20 silicon carbide abrasive, portions not to be coated being masked; it is kept scrupulously clean pending coating within no more than 4 hr. Priming with 0.002 or 0.003 in. of flame-sprayed aluminum, followed by plasma spray to the required thickness, prevents the hairline cracking that mars plasma-spray coating of one encapsulant.

Prolonged exposures to high humidity, salt spray, and thermal cycling have not impaired the following coatings: 0.010 in. of aluminum, with flame-sprayed primer followed by plasma spray; 0.010 in. of flame-

sprayed aluminum; 0.002 in. of flame-sprayed aluminum plus 0.005 in. of flame-sprayed 1010 steel plus 0.002 in. of flame-sprayed aluminum.

References:

1. Mackay, T. L.; Muller, A. N.: Tech. Note SM-48445, Astropower Laboratory, Feb. 1965.
2. Silvestri, R.; Mackay, T. L.; Muller, A. N.: Tech. Rept. 5/338, Astropower Laboratory, Nov. 1965.

Notes:

1. The process may interest manufacturers of electrical or electronic equipment.
2. No further documentation is available. Inquiries may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama 35812
Reference: B69-10607

Patent status:

No patent action is contemplated by NASA.

Source: A. N. Muller of
Douglas Aircraft Company
under contract to
Marshall Space Flight Center
(MFS-13570)

Category 01

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1. The purpose of this report is to provide a summary of the results of the investigation of the effect of the concentration of the electrolyte on the rate of the electrochemical reaction.

2. Summary of the results of the investigation

The results of the investigation are summarized in the following table:

Concentration of electrolyte (M)	Rate of reaction (g/hr)
0.1	0.15
0.2	0.25
0.3	0.35
0.4	0.45
0.5	0.55
0.6	0.65
0.7	0.75
0.8	0.85
0.9	0.95
1.0	1.05

The results of the investigation show that the rate of the electrochemical reaction increases with the concentration of the electrolyte. The rate of reaction is highest at a concentration of 1.0 M and lowest at a concentration of 0.1 M.

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